



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,166	02/18/2004	Richard W. Foote	P05810	1802

23990 7590 06/19/2006

DOCKET CLERK
P.O. DRAWER 800889
DALLAS, TX 75380

EXAMINER

NGUYEN, TUAN H

ART UNIT PAPER NUMBER

2813

DATE MAILED: 06/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/781,166

Applicant(s)

FOOTE, RICHARD W.

Examiner

Tuan H. Nguyen

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 21-35 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-10, 21-35 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-10, 21-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The wet etch process is performed "to etch through the phosphorus doped oxide layer and partially into the boron doped oxide layer" for the time period required to etch through the layer of phosphorus doped oxide in the newly amended claims 1, and 21, 29 is not supported by the instant specification. Note that the time period is calculated for the wet etch process to etch only through the phosphorus doped oxide layer, not further partially etch into the boron doped oxide layer, the partially etch into the boron doped oxide layer is not performed in the (calculated) the time period but after the time period has elapsed (specification, page 12, lines 9-12).

This is a new matter rejection.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10, 21-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, 21, 29, it is unclear as to how could the boron doped oxide layer be partially etched in the required time period calculated for a wet etch process to etch through the layer of phosphorus doped oxide.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 21-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Background of the invention in view of Konoshi (US pat. No. 6,168,977) and Tenney et al. (cited ref.).

Background of the invention, fig. 1 and related text on pages 1-3 discloses the conventional method for forming a thin layer of oxide of about 5000 Angstroms over the metal link layer 120 of the laser trimmed fuse with the use of a masked partial etch-back of the passivation layers 130, 140 over the final layer of metal 120.

Background of the invention fails to teach the formation of uniform oxide layer by using a (boron) doped oxide layer having a fast etch rate over a (phosphorus) doped oxide layer having a slow etch rate so that the upper oxide layer could be firmly

removed without further etching into the lower oxide layer, preserving the uniform thickness in the lower oxide layer.

Konishi, in a related art as disclosed in figs. 1A-1E and text on col. 3-4, teaches the use of pattern 5b having faster etch rate than that of the insulation layer 4 of doped oxide in the process of etching to form opening 10, since the insulation layer 4 having a uniform thickness for enabling the fuse blow can remain on the fuse patterns 3b, 3c (fig. 1E, col. 4, next to last paragraph), the time required for etching from dividing the thickness by a value of etch rate is inherently calculated in order to stop process from further etching into the lower layer 4.

Tenney et al., in a submitted article entitled: " Etch Rates of Doped Oxides in Solutions of Buffered HF", pages 1091-1095, teaches the relative wet etching characteristics of BSG and PSG in which etch rate of PSG increases much more rapidly with increasing dopant concentration than do those of BSG.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used layers with different etch rates such as boron doped oxide layer and phosphorus doped oxide layer which have much higher etch rates in wet etching process as suggested by Tenney et al. and Konishi in the conventional process as disclosed in the Background of the invention since it would provide a uniform oxide layer over a metal links layer of a laser trimmed fuse.

With respect to claims 7, 9, 10, the thicknesses of first and second layers, and a further step of etching down to a desired thickness of the layer of boron doped oxide in order to obtain an oxide layer having a thickness of 5000 angstroms over the metal link

is considered to involve routine optimization while has been held to be within the level of ordinary skill in the art, as noted In Re Aller 105 USPQ233, 255 (CCPA 1955).

Therefore, one of ordinary skill in the requisite art at the time the invention was made would have formed layer with a suitable thickness range in the method for forming oxide layer over the metal link layer in order to optimize the result.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

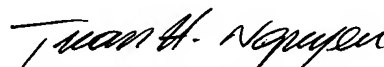
Applicant's arguments filed 4/21/06 have been fully considered but they are not persuasive.

The combination teachings of laser trimmed fuses in APA in view of Konishi for forming an insulation layer having uniform thickness remained over the fuse patterns and Tenney et al. for the use of PSG and BSG with different etch rates in wet etching is reasonable and sufficient to support a prima facie case of obviousness. The test of obviousness is what the combined teachings of the references as a whole would have suggested to one of ordinary skill in the art. See *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991) and *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). Here, Konishi teaches the use of pattern 5b having faster etch rate than that of the doped oxide layer 4 in the process of etching to form opening 10 and exposed layer 4 having uniform thickness on the fuse patterns for enabling the fuse blowing. Konishi fails to teach the use of PSG and BSG; however, PSG and BSP with fast and slow etch rates respectively in wet etching has been suggested by Tenney et al.. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the combined teachings from Tenney et al. and Konishi in the conventional process for forming laser trimmed fuse in APA for simplifying in process complexity, and obtaining an optimum result.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is 571-272-1694. The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Tuan H. Nguyen
Primary Examiner
Art Unit 2813